

# Instructions

for the



## AUDIO SOUND SWITCH

Model SK-111

**WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.**

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## INTRODUCTION

Your Heathkit Model SK-111 Audio Sound Switch kit will use your voice or room noise to switch AC power on or off to an electrical device, such as a lamp or intrusion alarm, etc. This Manual includes step-by-step assembly instructions, simple operation directions, a brief troubleshooting guide, and a schematic diagram. For additional information on the product description, product applications, and educational material, refer to the SK-100 series Educational Manual.

Refer to the "Kit Builder's Guide" for additional information on:

- Parts identification.
- Tools.
- Wiring.
- Soldering.
- Step-by-Step Assembly procedures.
- Warranty and Customer Service information.

## PARTS LIST

Remove the parts from the shipping carton and check each part against the following list. The key numbers correspond to those on the numbered illustrations. Do not remove components that are supplied on a tape from the tape until you use them in a step. If a part is packed in an individual envelope with the part number on it, identify the part; then return it to the envelope until it is called for

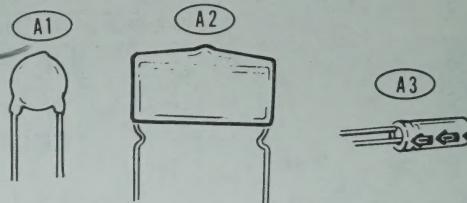
in a step. Do not throw away any packing material until you account for all the parts.

To order a replacement part, always include the PART NUMBER. Use the Parts Order Form furnished with this kit. If a Parts Order Form is not available, refer to "Replacement Parts" in the "Kit Builder's Guide."

KEY	HEATH	CIRCUIT		
No.	Part No.	QTY.	DESCRIPTION	Comp. No.

### CAPACITORS

A1	21-56	1	470 pF (470 K) ceramic	C3
A1	21-72	1	.005 $\mu$ F ceramic	C9
A1	21-176	2	.01 $\mu$ F ceramic	C4, C5
A2	27-62	1	.68 $\mu$ F polyester	C8
A3	25-900	1	1 $\mu$ F electrolytic	C2
A3	25-905	2	470 $\mu$ F electrolytic	C6, C7



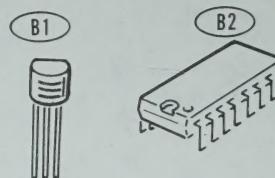
### TRANSISTOR — INTEGRATED CIRCUIT (IC)

NOTE: Transistors and integrated circuits may be marked for identification in any one of the following four ways:

1. Part number.
2. Type number. (For an integrated circuit, this refers only to the numbers and letters shown in **BOLD** print. Disregard any other numbers or letters shown on the IC.)
3. Part number and type number.
4. Part number with a type number other than the one shown.

B1	417-801	1	MPSA20 transistor
B2	442-71	1	LM3900 IC

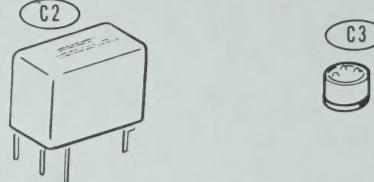
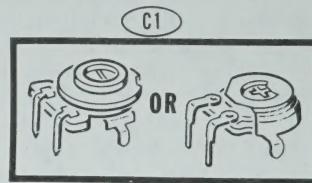
Q1	OK
U1	OK



### OTHER ELECTRONIC COMPONENTS

C1	10-383	1	10 k $\Omega$ control
C2	69-50	1	Relay
C3	480-78	1	Microphone

R2	OK
K1	OK
A1	OK



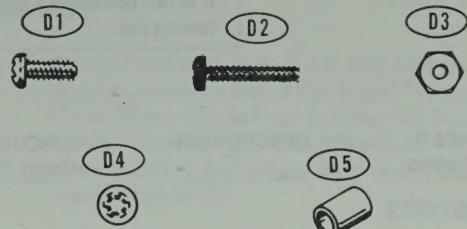
**Heathkit®**

KEY HEATH QTY. DESCRIPTION  
No. Part No.

CIRCUIT  
Comp. No.

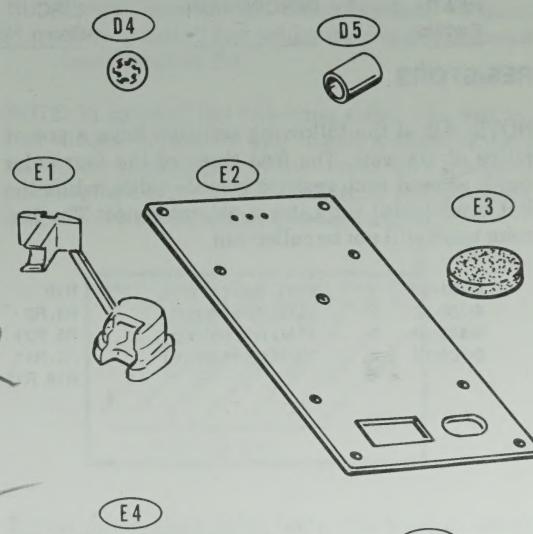
**HARDWARE**

D1 250-1469 4 4-40 x 5/16" screw  
D2 250-1319 4 4-40 x 5/8" screw  
D3 252-2 4 4-40 nut  
D4 254-9 4 #4 lockwasher  
D5 255-49 4 Spacer

**LINE CORD - WIRE - SLEEVING**

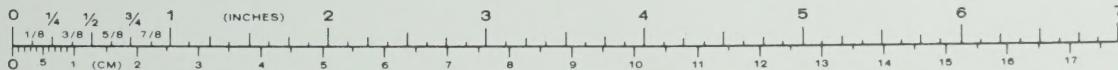
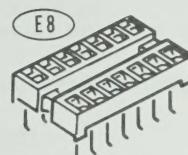
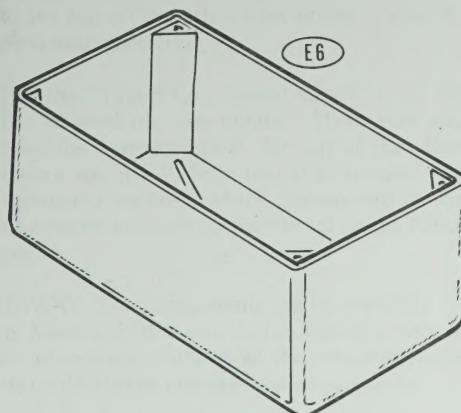
89-49 1 Line cord  
340-2 6" Bare wire  
344-182 3" Black wire  
344-219 8" White wire  
346-1 4" Sleeving

OK

**MISCELLANEOUS**

E1 75-24 1 Strain relief  
85-3176-1 1 Circuit board  
E2 205-1989 1 Case top  
E3 263-7 4 Felt pad  
E4 390-2908 1 Model label \*  
E5 1 Blue and white label \*  
E6 408-11 1 Case  
E7 434-147 1 AC socket  
E8 434-298 1 14-pin IC socket  
597-260 1 Parts Order Form \*  
597-4212 1 Kit Builder's Guide \*  
1 Instruction Book (see Page 1 for the part number)  
Solder

\* These items may be packed inside the Manual.



**TAPED COMPONENTS**

The remaining parts are supplied on taped strips.  
It is not necessary to check them against the following list.

<u>HEATH</u> <u>Part No.</u>	<u>QTY.</u>	<u>DESCRIPTION</u>	<u>CIRCUIT</u> <u>Comp. No.</u>	<u>HEATH</u> <u>Part No.</u>	<u>QTY.</u>	<u>DESCRIPTION</u>	<u>CIRCUIT</u> <u>Comp. No.</u>
<b>RESISTORS</b>							
6-221-12	1	220 $\Omega$ (red-red-brn)	R19	6-474-12	1	470 k $\Omega$ (yel-viol-yel)	R4
6-103-12	2	10 k $\Omega$ (brn-blk-org)	R1, R3	6-105-12	3	1 M $\Omega$ (brn-blk-grn)	R13, R15, R17
6-473-12	2	47 k $\Omega$ (yel-viol-org)	R5, R21	6-225-12	4	2.2 M $\Omega$ (red-red-grn)	R6, R7, R8, R12
6-104-12	4	100 k $\Omega$ (brn-blk-yel)	R9, R11, R16, R18	6-106-12	1	10 M $\Omega$ (brn-blk-blu)	R14
<b>DIODES</b>							
56-26	1	1N191 (brn-wht-brn)	OK	56-26	1	1N191 (brn-wht-brn)	D1
56-608	1	1N4739A	OK	56-608	1	1N4739A	D4
57-65	2	1N4002	OK	57-65	2	1N4002	D2, D3
<b>MISCELLANEOUS</b>							
21-786	1	.1 $\mu$ F (104) axial-lead ceramic capacitor.	OK	21-786	1	.1 $\mu$ F (104) axial-lead ceramic capacitor.	C1

## STEP-BY-STEP ASSEMBLY

Refer to Pictorial 1 as you read the following notes and perform the following steps.

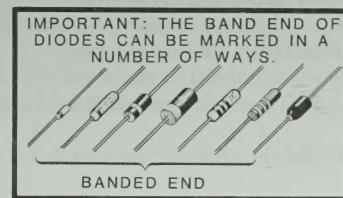
## NOTES:

1. Some circuit board drawings, such as the one shown in Pictorial 1, are divided into two or more sections. These sections show you which area of the circuit board you are working in for a specific series of steps.
  2. In each series of steps, you install parts in a top-to-bottom, left-to-right sequence. Occasionally, you may be directed to install a part out of sequence.
  3. Check off each step as you perform it. You may also wish to place a checkmark near each component on the Pictorial as you install it.
  4. In general, solder instructions are given only at the end of a series of similar steps; you may solder more often if you wish.
  5. The circuit board has one side with the component outlines shown on it. This is referred to as the "component side."
  - ✓ Position the circuit board as shown in the Pictorial with the component side up. NOTE: Always install components on the component side of the circuit board and solder the leads to the foil on the other side, unless a step directs you otherwise.
  - ✓ Cut the "Taped Component Chart" from the last page of the this manual. Make sure you read the instructions at the top of the chart before you use it. Note that it is divided into numbered sections which correspond to the numbered sections on the circuit board Pictorial.
- IMPORTANT:** The components are in assembly sequence. Make sure that you do not install a component out-of-sequence; otherwise, the remaining components could also be installed out-of-sequence.

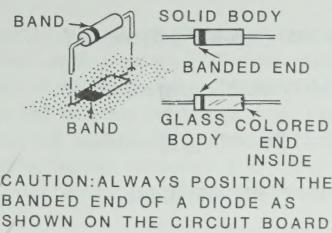
## Section 1

- (✓) R8: Cut the first part, a  $2.2\text{ M}\Omega$  (red-red-grn) resistor, from the top of the Taped Component Chart. Then refer to Page 1 of the "Kit Builder's Guide" and follow the procedure outlined there to install and solder the resistor at circuit board location R8.

NOTE: In some of the following steps, you will install diodes. Whenever you install a diode, always match the banded end of the diode with the band mark on the circuit board. **The circuit will not work properly if a diode is installed backwards.**



If your diode has a solid body, the band is clearly defined. If your diode has a glass body, however, do not mistake the colored end inside the diode for the banded end. Look for a band painted on the outside of the glass.

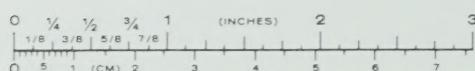


- (✓) D1: 1N191 (#56-26, brn-wht-brn) diode.
- (✓) R7:  $2.2\text{ M}\Omega$  (red-red-grn) resistor.
- (✓) C1:  $.1\text{ }\mu\text{F}$  (104) axial-lead ceramic capacitor.

- (✓) R3: 10 kΩ (brn-blk-org) resistor.
- (✓) R1: 10 kΩ (brn-blk-org) resistor.
- (✓) R19: 220 Ω (red-red-brn) resistor.
- (✓) R21: 47 kΩ (yel-viol-org) resistor.
- (✓) D3: 1N4002 (#57-65) diode.
- (✓) D4: 1N4739A (#56-608) diode.
- ( ) Solder the leads to the foil and cut off the excess lead lengths.

## Section 2

- (✓) R13: 1 MΩ (brn-blk-grn) resistor.
- (✓) R14: 10 MΩ (brn-blk-blu) resistor.
- (✓) R12: 2.2 MΩ (red-red-grn) resistor.
- (✓) R11: 100 kΩ (brn-blk-yel) resistor.
- (✓) R5: 47 kΩ (yel-viol-org) resistor.
- (✓) R6: 2.2 MΩ (red-red-grn) resistor.
- (✓) R9: 100 kΩ (brn-blk-yel) resistor.
- (✓) R4: 470 kΩ (yel-viol-yel) resistor.
- (✓) R16: 100 kΩ (brn-blk-yel) resistor.
- (✓) R18: 100 kΩ (brn-blk-yel) resistor.
- (✓) R15: 1 MΩ (brn-blk-grn) resistor.
- (✓) R17: 1 MΩ (brn-blk-grn) resistor.
- (✓) D2: 1N4002 (#57-65) diode.
- (✓) Remove a 1" length of insulation from the 3" black wire.
- (✓) Cut a single 1" strand (one of the fine wires) from the black wire. This single strand will be used as a fuse wire. Save the remaining stranded wire for possible future use as fuse wires.



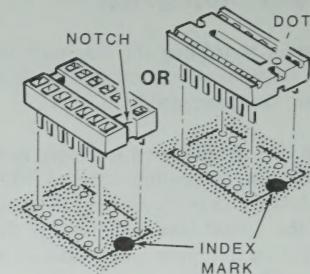
(✓) Install the single strand of wire into the circuit board holes marked "FUSE LINK."

(✓) Solder the leads and fuse wire to the foil and cut off the excess lead and wire lengths.

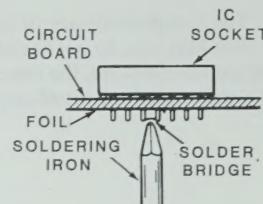
Refer to Pictorial 2 for the following steps.

NOTE: Before you install an IC socket, make sure the pins are straight. If there is any kind of identification mark (notch, dot, arrowhead, etc.) at or near one end of the socket, place this marked end toward the index mark on the circuit board (this index mark should still be visible after you install the socket). Then start the pins into the circuit board holes.

Hold the socket in place while you turn the circuit board over and lay it on top of the socket on your work area. The board will hold the socket in place. At first, solder only two pins at diagonally opposite corners of the socket. After the solder cools, check to make sure the socket is tight against the circuit board. If not, reheat the pins while you push against the socket to reseat it. Then solder the remaining pins to the foil.



NOTE: A solder bridge may form when you make solder connections at closely spaced foils. Therefore, after each solder step, carefully inspect the foil for solder bridges and remove any that have formed. To remove a solder bridge, hold the circuit board foil-side-down as shown, and hold the soldering iron tip between the two points that are bridged. The solder will flow down the soldering iron tip to clear the bridge.



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- (✓) 14-pin IC socket at U1. Solder the socket pins to the circuit board foil. Be careful that you do not form solder bridges between adjacent foil pads.

- (✓) U1: Read the "IC Installation" instructions in the "Kit Builder's Guide." Then prepare and install the LM3900 (#442-71) IC in the socket at U1.

- (✓) Recheck the IC for any bent pins and for proper installation of the pin 1 end.

NOTE: When you mount ceramic capacitors in the following steps, do not push the leads all the way through the circuit board holes. The leads have a coating of insulation that may keep you from making a good solder connection.

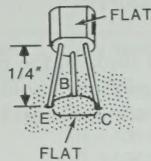
- (✓) C3: 470 pF (470 K) ceramic capacitor.

- (✗) C4: .01  $\mu$ F ceramic capacitor.

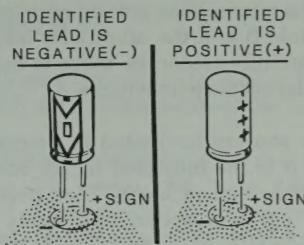
- (✗) C5: .01  $\mu$ F ceramic capacitor.

- (✓) Solder the leads to the foil and cut off the excess lead lengths.

- (✓) Q1: MPSA20 (#417-801) transistor. First position the transistor so the flat is over the flat of the outline on the circuit board. Then insert the leads into the corresponding holes in the circuit board and position the bottom of the case 1/4" above the circuit board. Bend the transistor leads out slightly on the foil side of the board to hold it in place. Solder the leads to the foil and cut off any excess lead lengths.



NOTE: When you install an electrolytic capacitor, always identify the markings near the leads. One lead will have a positive (+) mark or a negative (-) mark near it. Be sure to install the positive lead in the positive-marked hole and the negative lead in the negative-marked hole. Be careful; only the negative lead may have a mark near it.



- (✓) C2: 1  $\mu$ F electrolytic capacitor.

- (✓) C6: 470  $\mu$ F electrolytic capacitor.

- (✗) C7: 470  $\mu$ F electrolytic capacitor.

- (✗) C8: .68  $\mu$ F polyester capacitor.

- (✗) C9: .005  $\mu$ F ceramic capacitor.

- (✓) Solder the leads to the foil and cut off the excess lead lengths.

- (✓) K1: Relay (#69-50). Solder the lugs to the foil.

Refer to Pictorial 3 for the following steps.

- (✓) Cut two 1-1/2" lengths of bare wire.

- (✓) Refer to inset drawing #1 on Pictorial 3 and, using a pair of needlenose pliers, bend a 1/8" "foot" at one end of each 1-1/2" length of wire. Then melt a small bead of solder on the foot of each wire.

- (✓) Use a pair of needlenose pliers to hold the "foot" end of one 1-1/2" wire against one foil pad on the microphone (#480-78). Then, using the tip of your soldering iron, heat the wire and foil pad until the solder melts. Remove the soldering iron and allow the connection to cool before you release the wire.

- (✓) Similarly, solder the "foot" of the remaining wire to the other foil pad on the microphone.

- (✓) Cut two 1-1/8" lengths of sleeving.

- (✓) Slide a 1-1/8" length of sleeving over each microphone wire.

NOTE: In the next step, the wire connected to the case foil (see inset drawing #1) will be referred to as the "ground wire."

- (✓) Insert the microphone ground wire into circuit board hole B and the other wire into hole A. Then carefully solder the wires to the foil and cut off the excess wire lengths.

NOTE: When you are instructed to prepare a wire (or lead), cut it to the indicated length and remove 1/4" of insulation from each end. Then twist the fine wire strands tightly together and apply a small amount of solder to hold the fine strands together.

- (✓) Prepare a 3-1/2" and a 4" length of white wire.

NOTE: When you are instructed to install a prepared wire in each of the next two steps, first insert one end of the wire into the proper circuit board hole. Then solder it to the foil and cut off the excess wire length. The free end of the wire will be connected later.

Install the prepared white wires as follows:

- (✓) 3-1/2" white wire in hole E.
- (✓) 4" white wire in hole C.
- (✓) Turn the circuit board over so the foil side faces up.
- (✓) R2: Refer to inset drawing #2 on Pictorial 3 and install the 10 k $\Omega$  control (#10-383) on the circuit board at R2. Solder the lugs to the foil.

### CIRCUIT BOARD CHECKOUT

Carefully inspect the foil side of the circuit board for the following most-commonly-made errors:

- (✓) Unsoldered connections. NOTE: You will install wires in holes D and F later.
- (✓) Poor solder connections.
- (✓) Solder bridges between foil patterns.
- (✓) Protruding leads which could touch together.

Refer to the illustrations where parts are installed as you make the following checks:

(✓) Diodes for the proper type and positioning of the banded end.

(✓) Electrolytic capacitors for the correct position of the positive (+) or negative (-) markings.

(✓) Transistor for the proper installation.

(✓) IC for the proper installation.

(✓) Set the circuit board aside.

Refer to Pictorial 4 for the following steps.

(✓) Position the case top as shown in the Pictorial.

(✓) Refer to Detail 4A and separate the two leads at the free end of the line cord for a length of 1-1/2", if this has not already been done. Then prepare both lead ends.

(✓) Again refer to Detail 4A and, using a pair of standard household gas pliers, crimp the strain relief onto the line cord 4" from its free end. Then position the case top and the line cord with its ribbed lead as shown and, from the outside of the case top, insert the line cord leads through hole AF. Squeeze the strain relief together as you insert it into the hole. Be careful that you do not crack the case top.

(✓) S1: Refer to inset drawing #1 and position the AC socket with the wide slot as shown. Then carefully press the socket into the case top cut-out at S1 until the tabs lock into place.

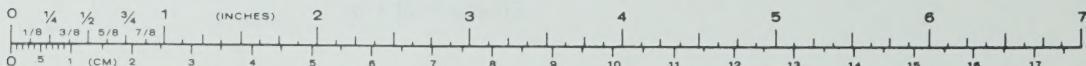
(✓) Position the circuit board assembly over the case top as shown.

Connect the line cord leads to the component side of the circuit board as follows. Solder each lead as you connect it and cut off the excess lead lengths.

(✓) Ribbed lead in hole F.

(✓) Smooth lead in hole D.

NOTE: Whenever you are instructed to "make a mechanically secure connection," as in the next step, form a hook in the bare end of the wire as shown in inset drawing #2. Then hook the bare wire end through the lug, crimp it securely in place, and solder it to the lug.



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Connect the free end of each of the white wires coming from the circuit board assembly to AC socket S1 as follows:

- ( ) 4" white wire coming from hole C to S1 lug 1. Make a mechanically secure connection.
- ( ) 3-1/2" white wire coming from hole E to S1 lug 2. Make a mechanically secure connection.

## RESISTANCE CHECKS

**WARNING:** Do not apply AC power to your Sound Switch for the following resistance checks. You will be instructed when to apply power later.

Refer to Pictorial 5 for the following checks

### NOTES:

1. You will need an ohmmeter to perform the following checks. The instrument should have sufficient test voltage to forward bias semiconductor junctions (at least .7 volt between the two test leads). Connect the ohmmeter test leads to the points shown in the chart below. If you do not obtain the proper readings, try reversing the meter leads and repeat the measurements. If the readings are still incorrect, refer to "In Case of Difficulty" on Page 11.
2. If you cannot obtain an ohmmeter, proceed to "Final Assembly."

COMMON LEAD	POSITIVE LEAD	RANGE SETTING	READING
Either line cord plug prong.	Other line cord plug prong.	R × 10 kΩ	INF (infinite).
TP1	TP2	R × 1000 Ω	3000 Ω or more.
TP1	TP3	R × 1000 Ω	5000 Ω or more.
TP1	TP4	R × 100 Ω	500 Ω or more.
TP1	TP5	R × 100 Ω	1000 Ω or more.
TP1	TP6	R × 10 kΩ	100 kΩ or more.
TP1	TP7	R × 1 MΩ	5 MΩ or more.
TP1	TP8	R × 10 kΩ	100 kΩ or more.
TP1	TP9	R × 1000 Ω	5000 Ω or more.

## FINAL ASSEMBLY

Use the following procedure to mount the circuit board assembly to the **bottom side** of the case top:

1. From the indicated side of the case top, insert 4-40 × 5/8" screws into holes AB, AC, AD, and AE. Then, making sure the screws do not fall out, turn the case top over and place it in the palm of your hand.
  2. Place a spacer on each of the four screws.
  3. Position the circuit board assembly over the case top so each mounting hole lines up with the corresponding screw. Then lower the circuit board down onto the screws so it rests on the spacers.
  4. Secure the circuit board assembly to the case top with #4 lockwashers and 4-40 nuts.
- NOTE: Be sure the circuit board assembly is centered between the longer sides of the case top before you tighten the hardware.

NOTE: In the following step, bend the leads for the microphone at a point about halfway between the top of the circuit board and the bottom of the microphone while you keep the lower portion of the wires perpendicular to the board. Otherwise, you may pull the small foil areas away from the circuit board.

- ( ) Refer to inset drawing #3 and carefully bend the wires of the microphone so it is positioned about 1/16" from the bottom side of the case top and centered over the three holes as shown in the Pictorial.

- ( ) Check the connections on AC socket S1 to make sure they are properly soldered and that there are no protruding wire ends that could touch each other. Also, shake out any loose wire clippings, solder, or foreign matter that may be lodged in the wiring.

Refer to Pictorial 6 for the following steps.

- ( ) Carefully remove the backing paper from the blue and white label. Then press the label into place on the outside bottom of the case at the location shown. NOTE: Be sure to refer to the numbers on this label in any communications you may have with the Heath Company about this kit.
- ( ) Mount the case top assembly onto the case with four 4-40 × 5/16" screws.

- ( ) Carefully remove the backing paper from the model label. Then press the label into place on the case top so its top edge is even with the access hole for Sensitivity control R2 and centered between the long sides of the case top.
- ( ) Remove the backing paper from the felt pads and press the pads into place over the round case extrusions near the four case corners as shown.

This completes the "Step-by-Step Assembly." Proceed to "Sound Switch Checkout."

## SOUND SWITCH CHECKOUT

**WARNING: The full AC line voltage, which is potentially lethal, will be present at several locations in your Sound Switch during the following checkout procedure. Do not apply power to your Sound Switch until you are instructed to do so in a step.**

Refer to Pictorial 7 for the following steps.

- ( ) Use a small-bladed screwdriver to set Sensitivity control R2 to its midrange position as shown in the inset drawing.
- ( ) Connect a lamp, which is rated at 40 to 150 watts, to an AC outlet to make sure it is turned on (the bulb lights).
- ( ) Disconnect the lamp from the AC outlet. Instead, connect it to socket S1 of your Sound Switch.

- ( ) Connect the Sound Switch's line cord plug to an AC outlet. The lamp should not light when there is no noise. It should light when you shout or make noise, like clapping your hands.
- ( ) After a quiet period lasting at least 3-4 seconds, again talk or make noise; the light should go out.
- ( ) You may, if you prefer, adjust Sensitivity control R2 to turn on the light with the least amount of room noise.
- ( ) Turn the lamp's on/off switch off. Unplug the Sound Switch's line cord plug and then unplug the light.

**IMPORTANT: Do not connect an electrical device that draws more than 3 amperes of current (360 watts maximum load) to your Sound Switch. Otherwise, you could overload the Sound Switch.**

This completes the "Sound Switch Checkout."

## IN CASE OF DIFFICULTY

**WARNING: Because potentially lethal voltages are present at several locations inside the Sound Switch, do not make voltage measurements while it is plugged into an AC outlet. Instead, first disconnect it from the AC outlet; then make resistance measurements while you compare the readings on your Sound Switch with those given on the Schematic Diagram.**

Begin your search for any trouble that develops after assembly by carefully following the steps listed below in the "Visual Checks." If you do not locate the trouble after completing the "Visual Checks," refer to the "Troubleshooting Chart."

You will find it helpful to refer to the Schematic Diagram and Circuit Description as you trace the circuit to locate the cause of the trouble.

**NOTE:** A "Circuit Board X-Ray View" is provided on Page 13 to help you locate the various circuit components, and compare foil patterns in case you suspect that a solder bridge exists between the foils.

### Visual Checks

1. Carefully inspect the complete unit for any obvious errors, such as improperly soldered connections, wiring errors, bare wires touching each other, etc. Look for bits of solder, pieces of wire, or other foreign matter lodged in the wiring or components.

2. Make sure each wire or lead is connected to the proper point. It is quite helpful to have another person check your work. Someone who is not familiar with the unit will often notice an error that you have repeatedly overlooked.
3. Carefully check all solder connections to make sure they are bright and shiny. About 90% of the kits that are returned to the Heath Company for service do not function properly due to poor solder connections. Reheat questionable connections and, if necessary, apply a little more solder to make sure all connections are soldered as described in the "Kit Builder's Guide."
4. Check to be sure that each diode lead is connected to the proper point. Make sure that each diode band is positioned as shown in the Pictorial.
5. Check the value of the parts. In each step, be sure the proper part has been wired into the circuit, as shown in the Pictorial. It would be easy, for example, to install a 100 k $\Omega$  (brn-blk-yel) resistor where a 10 k $\Omega$  (brn-blk-org) resistor should have been installed.

**NOTE:** In an extreme case where you are unable to resolve a difficulty, refer to the "Customer Service" information in the "Kit Builder's Guide." Your Warranty is also located there.

## Troubleshooting Chart

The following chart lists conditions and possible causes of several specific malfunctions. If a particular part (U1, for example) is mentioned as a possible cause, check that part to see that it is installed and

soldered correctly. It is also possible, on rare occasions, that a part may be faulty and require replacement. In that case, refer to "Replacement Parts" in the "Kit Builder's Guide."

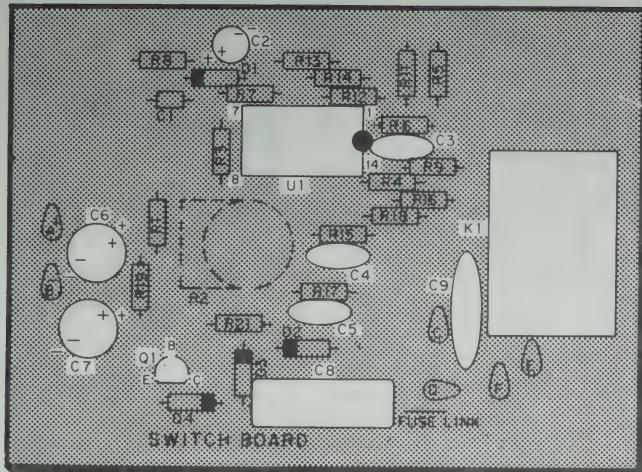
PROBLEM	POSSIBLE CAUSE
Noise does not energize switched device (lamps, for example).	<ol style="list-style-type: none"> <li>1. Switched device is turned off.</li> <li>2. Sensitivity control R2 is set too low.</li> <li>3. Open wire strand at FUSE LINK.</li> <li>4. Microphone leads are interchanged.</li> <li>5. Transistor Q1 incorrectly installed.</li> <li>6. Integrated circuit U1 incorrectly installed.</li> </ol>
Sound Switch is activated by vibrations (caused by doors being opened or closed, and people walking, for example.)	<ol style="list-style-type: none"> <li>1. Sensitivity control R2 set too high.</li> </ol>
Switched device remains turned on after it is first energized.	<ol style="list-style-type: none"> <li>1. Sensitivity control R2 set too high.</li> <li>2. Transistor Q1 incorrectly installed.</li> <li>3. Foil or solder bridge on circuit board.</li> </ol>

## SPECIFICATIONS

Power Source .....	120 VAC, 50/60 Hz.
Maximum Load .....	360 watts (3 amperes).
Net Weight .....	12 oz. (350g).
Overall Dimensions .....	5-7/8" L × 3-1/8" W × 2-3/8" D (14.9 x 7.9 x 6 cm).

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The Heath Company reserves the right to discontinue products and to change specifications at any time without incurring any obligation to incorporate new features in products previously sold.



## PICTORIAL 2

## Troubleshooting Chart

The following chart lists conditions and possible causes of several specific malfunctions. If a particular part (U1, for example) is mentioned as a possible cause, check that part to see that it is installed and

soldered correctly. It is also possible, on rare occasions, that a part may be faulty and require replacement. In that case, refer to "Replacement Parts" in the "Kit Builder's Guide."

PROBLEM	POSSIBLE CAUSE
Noise does not energize switched device (lamps, for example).	<ol style="list-style-type: none"> <li>1. Switched device is turned off.</li> <li>2. Sensitivity control R2 is set too low.</li> <li>3. Open wire strand at FUSE LINK.</li> <li>4. Microphone leads are interchanged.</li> <li>5. Transistor Q1 incorrectly installed.</li> <li>6. Integrated circuit U1 incorrectly installed.</li> </ol>
Sound Switch is activated by vibrations (caused by doors being opened or closed, and people walking, for example.)	<ol style="list-style-type: none"> <li>1. Sensitivity control R2 set too high.</li> </ol>
Switched device remains turned on after it is first energized.	<ol style="list-style-type: none"> <li>1. Sensitivity control R2 set too high.</li> <li>2. Transistor Q1 incorrectly installed.</li> <li>3. Foil or solder bridge on circuit board.</li> </ol>

## SPECIFICATIONS

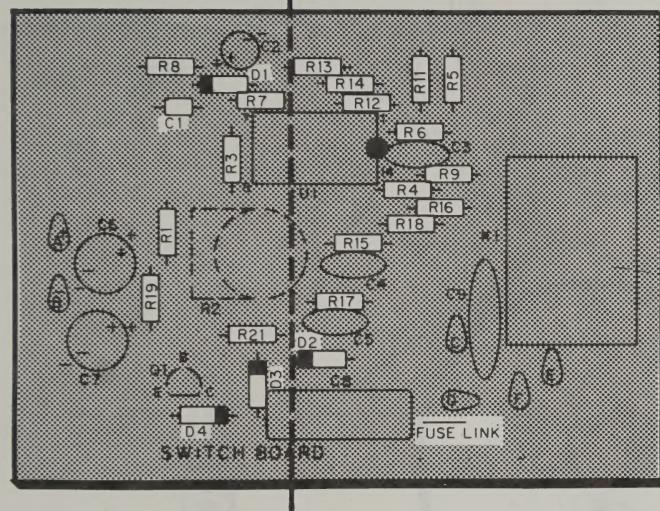
Power Source .....	120 VAC, 50/60 Hz.
Maximum Load .....	360 watts (3 amperes).
Net Weight .....	12 oz. (350g).
Overall Dimensions .....	5-7/8" L x 3-1/8" W x 2-3/8" D (14.9 x 7.9 x 6 cm).

The Heath Company reserves the right to discontinue products and to change specifications at any time without incurring any obligation to incorporate new features in products previously sold.

# ILLUSTRATION BOOKLET

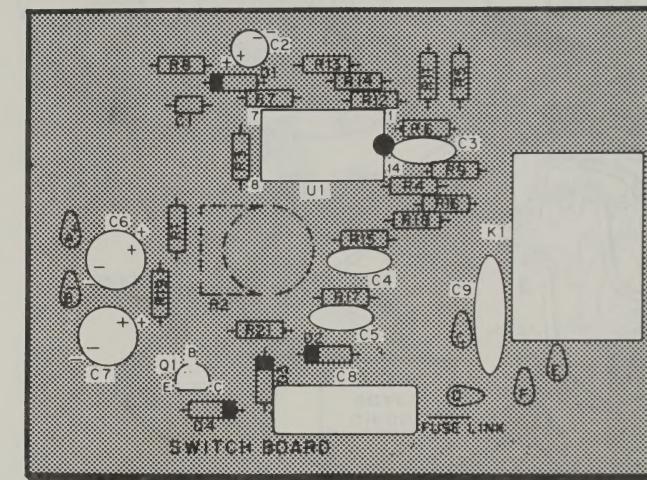
Part of 597-4231

SECTION 1

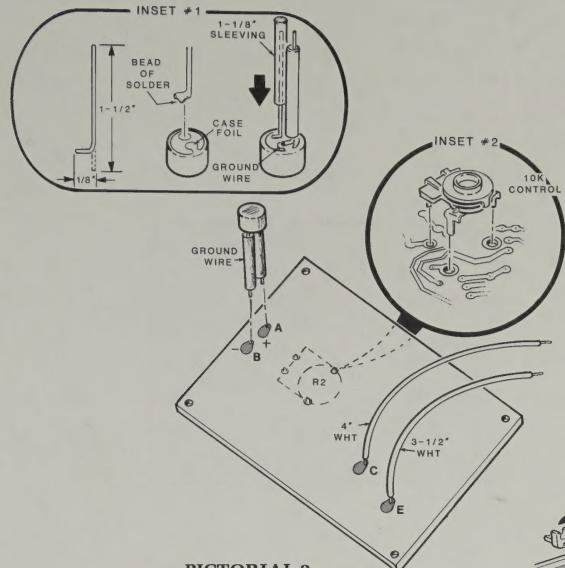


PICTORIAL 1

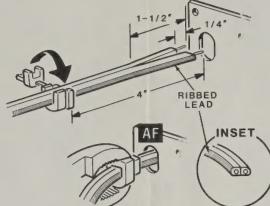
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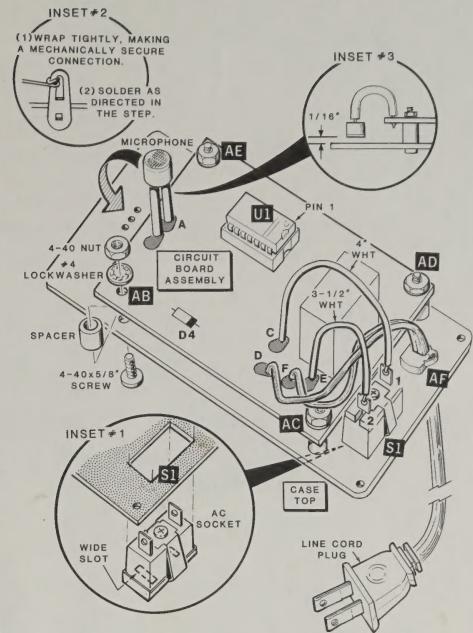
PICTORIAL 2



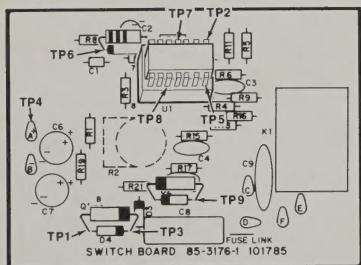
PICTORIAL 3



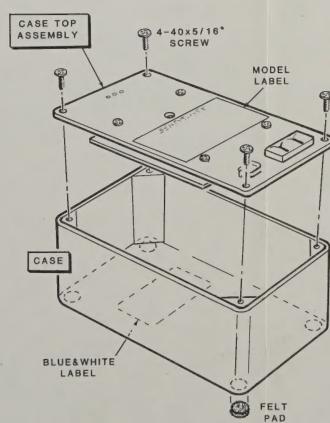
Detail 4A



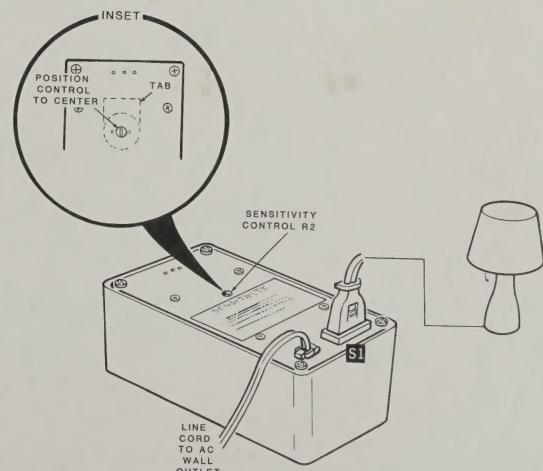
PICTORIAL 4



PICTORIAL 5



PICTORIAL 6

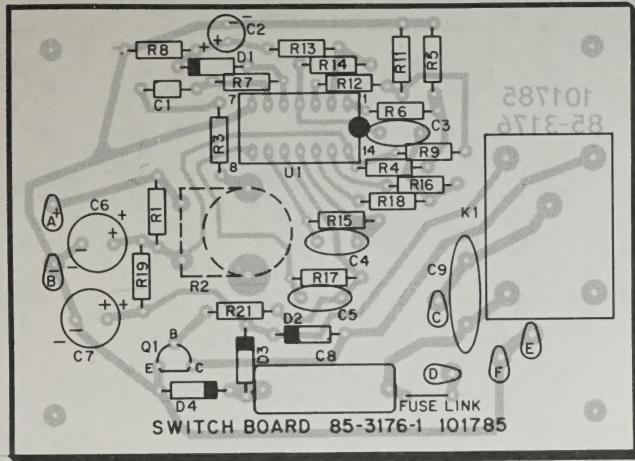


PICTORIAL 7

## CIRCUIT BOARD X-RAY VIEW

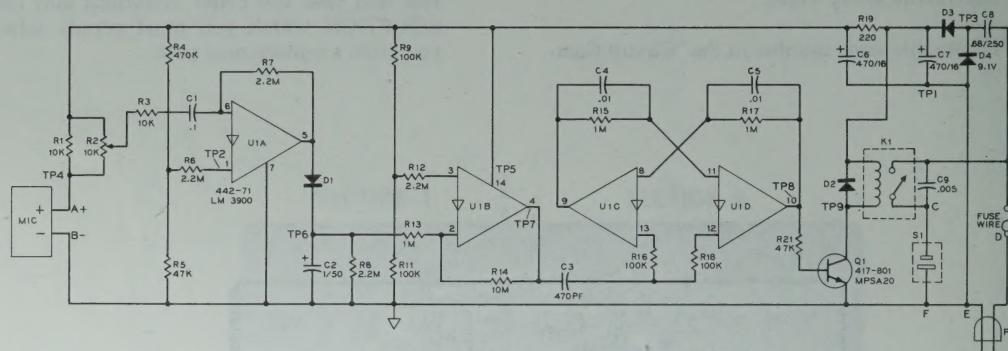
NOTE: To find the PART NUMBER of a component for the purpose of ordering a replacement part:

- A. Find the circuit component number (C1, R3, etc.) on the X-Ray View.
- B. Locate this same number in the "Circuit Com-
- C. Adjacent to the circuit component number, you will find the PART NUMBER and DESCRIPTION which you must supply when you order a replacement part.



(Shown from the component side.)

## SCHEMATIC



## NOTES:

1. All resistors have a power rating of 1/4-watt and a tolerance of 5% unless otherwise noted. Resistor values are in ohms ( $k=1000$ ;  $M=1,000,000$ ).
2. All capacitor values are in  $\mu F$  (microfarads) unless otherwise noted.
3. Indicates circuit board ground.